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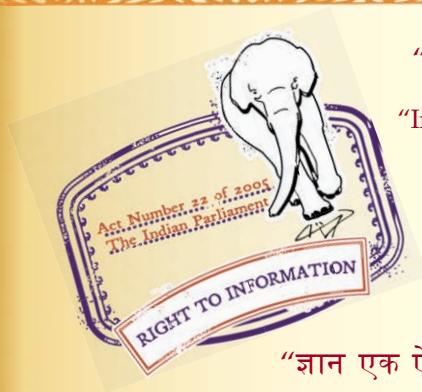
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IS 5077 (1969): Decorative lighting outfits [ETD 24:  
Illumination Engineering and Luminaries]



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IS : 5077 - 1969

*Indian Standard*  
SPECIFICATION FOR  
DECORATIVE LIGHTING OUTFITS

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

Gr 3

*July* 1969

# *Indian Standard*

## SPECIFICATION FOR DECORATIVE LIGHTING OUTFITS

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( Continued on page 2 )

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**AMENDMENT NO. 1 JUNE 2003**  
**TO**  
**IS 5077 : 1969 SPECIFICATION FOR DECORATIVE**  
**LIGHTING OUTFITS**

*(Page 10, clause 5.2.1)* — Substitute the following for the existing:

**'5.2.1** A component part of an outfit made of moulded rubber, polyvinyl chloride or any other suitable material, shall show no visible evidence of deterioration when subjected to test given in **5.2.2** and **5.2.3.**'

(ET 24)

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( Continued from page 1 )

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# *Indian Standard*

## SPECIFICATION FOR DECORATIVE LIGHTING OUTFITS

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 7 April 1969, after the draft finalized by the Illuminating Engineering Sectional Committee had been approved by the Electrotechnical Division Council.

**0.2** With increasing use of decorative lighting outfits for illuminating the interior of modern buildings, necessity has been felt to lay down minimum standards for design and construction of such lighting fittings in order to ensure their safe performance, good construction and high class of workmanship.

**0.3** This standard applies to the following types of decorative lighting outfits for indoor use only:

- a) Series-connected strings having midjet or miniature base lampholders;
- b) Multiple-connected strings having candelabra, intermediate or medium base lampholders; and
- c) Individual devices, such as wreaths, stars, crosses, candel sets and plaques.

**0.4** This standard is intended to deal with the specific requirements of decorative lighting outfits and shall be read in conjunction with IS : 1913-1969\*.

**0.5** In preparing this standard assistance has been derived from the following documents:

No. C. 152-1950 SAA Approval and test specification for decorative lighting outfits ( suitable for indoor use ). Standards Association of Australia.

C 22.2 No. 37-1964 Christmas-tree and other decorative lighting outfits. Canadian Standards Association.

**0.6** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

\*General and safety requirements for electric lighting fittings (*first revision*).

†Rules for rounding off numerical values (*revised*).



## **1. SCOPE**

**1.1** This standard specifies the design and constructional requirements and tests applicable to decorative lighting outfits for indoor use rated for a maximum voltage of 250 V.

## **2. TERMINOLOGY**

**2.0** For the purpose of this standard, the definitions given in IS : 1913-1969\* and the following definitions shall apply.

**2.1 Decorative Lighting Outfit** — It is a set of miniature Edison type (E.10) or bayonet type (B15 or B22) lampholders, with or without artistically decorated shades, diffusers or reflectors and together with conductors, for connection to an outlet in an electrical installation.

**2.2 String** — Means a number of unmounted lampholders connected, either in series or multiple, to an attachment-plug cap and may include a connector or current tap.

**2.3 Unit** — Means one or more lampholders connected, either in series or multiple, to an attachment-plug cap and having the lampholders mounted and located in a specific arrangement.

## **3. CONSTRUCTION**

### **3.1 General**

#### **3.1.1 Components**

**3.1.1.1** Component parts of outfits shall be of types specifically approved for the use intended, or shall be investigated with and as an integral part thereof.

**3.1.1.2** Electrical components provided as part of outfits shall conform to the relevant Indian Standard covering such components and also with respect to the suitability for the application.

**3.1.1.3** Wiring connections in general shall comply with IS : 1913-1969\*.

#### **3.1.2 Decorative Parts**

**3.1.2.1** Materials used for shades, diffusers, reflectors, or other decorative parts, including structural members, shall be either noncombustible or have burning characteristics not greater than that of a slow-burning material, such as cellulose acetate, methyl methacrylate, polystyrene, polyvinyl chloride, or nylon.

**3.1.2.2** Materials used for decorative parts shall not be subjected to temperature-rises in excess of those permitted for the specific material.

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\*General and safety requirements for electric lighting fittings (*first revision*).

**3.1.2.3** Reflectors which are intended to be installed on the lamp-holder and held in place by the lamp, shall be constructed so that a spacing of at least 3 mm will be maintained between the lamp or lampholder screw-shell and any metal or metal-foil parts of the reflector.

**3.1.2.4** Simulated needles, leaves and small branches which are located 5 cm or less from a lampholder of a decorative unit shall be of insulating material.

**3.1.3** *Terminal Parts* — Terminal parts and wiring connections shall comply with IS : 1913-1969\*.

#### **3.1.4** *Bushings*

**3.1.4.1** Openings in a wall, barrier, or enclosure through which flexible cord or insulated conductors pass shall have a smooth, well-rounded edge to prevent damage to the insulation of the conductors.

**3.1.4.2** An opening in metal shall be provided with an insulating bushing if other than a sheathed cord is involved.

**3.1.4.3** An opening in metal 1 mm or less in thickness shall be provided with a bushing, grommet, or the edge of the hole shall be formed over not less than 120 degrees.

**3.1.4.4** A bushing or grommet shall be securely held in place and an insulating bushing shall be not less than 1.2 mm in thickness. Bushings and grommets of ordinary soft rubber, wood, hot-moulded shellac or tar compositions are not acceptable.

#### **3.1.5** *Strain Relief*

**3.1.5.1** Strain relief shall be provided so that a pull applied to a flexible cord or external wiring will not be transmitted directly to a splice or to binding-screw terminals.

**3.1.5.2** If a knot in a flexible cord is used to provide strain relief, the surface against which the knot may bear, or with which it may come in contact, shall be free from burrs, projections, and sharp edges which may damage the insulation.

**3.1.5.3** A strain relief device having metal parts which bear on the flexible cord shall be used only on a jacketed type cord. All surfaces which may bear on the cord jacket shall be free from sharp edges and burrs.

**3.1.5.4** The connection of a flexible cord or pair of wires to an attachment-plug cap, cord connector or current tap by a means other than binding-screw terminals, shall be capable of withstanding cord anchorage test given in **5.1.1(d)**.

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\*General and safety requirements for electric light fittings (*first revision*).

## 3.2 Series-Connected Strings

### 3.2.1 General

**3.2.1.1** Strings having series-connected lampholders shall be limited to indoor use.

**3.2.1.2** Except as permitted by **3.2.1.4** the lampholders of the string shall be the same type, namely, either miniature or midget base.

**3.2.1.3** No fewer than eight miniature-base or ten midget-base lampholders shall be connected together in one string.

**3.2.1.4** Candelabra-base lampholders may be used in conjunction with miniature or midget lampholders of a flashing string, to accommodate ballast (current-limiting) lamps and one shall be located in each of the supply conductors adjacent to the attachment-plug cap. The rating of the ballast lamps shall be such that the two in series alone will limit the current to less than the current-carrying capacity of the conductors of the string.

### 3.2.2 Lampholders

**3.2.2.1** The bodies of screw-shell lampholders shall be of moulded phenolic, urea or equivalent composition with regard to mechanical strength, combustibility, and insulating characteristics. The bodies of special midget lampholders intended for use with lamps which do not have a screw-shell base, may be made of other materials subject to a special investigation to determine the suitability.

**3.2.2.2** The depth of the lamp cavity of miniature-base lampholders, measured from the plane of the open end to the highest point on the centre contact (depressed if a spring contact is used) shall be not less than 13.5 mm with a plus tolerance of 1.6 mm permitted.

**3.2.2.3** Means shall be provided for definitely securing screw-shells in place to prevent them from being loosened or twisted in normal use, with resulting strains on electrical connections.

**3.2.3 Filament-Shunting Devices** — Devices whether within the lampholder or lamp shall not permanently short-circuit the filament. A device which will operate to shunt the lamp filament (in the event of burnout of the filament) with a resistance approximately the same as, or greater than, that of the hot filament, may be used in conjunction with the lampholder or lamp. A shunting device which has a resistance lower than that of the lamp filament may be used if the shunt burns clear and opens the circuit before the current exceeds the allowable current-carrying capacity of the conductor.

### 3.2.4 Wiring

**3.2.4.1** Flexible cords and fixture wires used in the assembly of series-connected strings, shall be recognized as suitable for this use, shall comply

with IS : 434 ( Part I )-1964\* and IS : 694 ( Part I )-1964†.

**3.2.4.2 Braids** shall be prevented from unravelling at lampholders, attachment-plugs, etc.

**3.2.5 Strain Relief**— Unless the conductors to which lampholders are connected are run side by side and have an overall braid, strain relief shall be provided for the conductors at each lampholder.

### 3.3 Multiple-Connected Strings

#### 3.3.1 General

**3.3.1.1** All screw-shells on any one string shall be connected to the same conductor.

**3.3.1.2** A cord set provided for an indoor multiple-connected string having removable pin-type lampholders, shall consist of an attachment-plug cap, a suitable length of flexible cord and a cord-connector body having a single female outlet.

#### 3.3.2 Lampholders

**3.3.2.1** Means shall be provided for positively securing screw-shells in place to prevent them from being loosened or twisted in normal use with resulting strains on electrical connections.

**3.3.2.2** The depth of the lamp cavity of lampholders of the candelabra and intermediate-base size, measured along the axis from the highest point of the centre contact ( depressed for the spring type ) to the plane of the outer edge of the insulating shell shall be in accordance with Table 1.

**3.3.2.3** The body of an intermediate or candelabra-base lampholder shall be of moulded phenolic or urea composition, or of another material suitable for the purpose with respect to mechanical strength, combustibility and insulating characteristics.

**3.3.2.4** The screw-shell of an intermediate or candelabra-base lampholder shall be of copper or an alloy which contains not less than 80 percent copper.

**3.3.2.5** A medium-base lampholder shall have a body of moulded insulating material other than porcelain.

**3.3.2.6** Except as permitted by **3.3.1.2**, lampholders having pin-type terminals which puncture the insulation of the wire to make connection to the conductor shall be of the type which cannot be readily removed and shall be intended only for temporary installation. They shall be used only with cables containing copper conductors.

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\*Specification for rubber-insulated cables : Part I With copper conductors ( revised ).

†Specification for PVC insulated cables ( for voltages up to 1100 V ): Part I With copper conductors ( revised ).

TABLE 1 LAMPHOLDER DIMENSIONS

( Clause 3.3.2.2 )

TYPE OF LAMPHOLDER	MOUTH DIAMETER mm	DEPTH OF LAMP CAVITY, mm	
		Minimum	Maximum
Intermediate base	19.8	20.6	22.2
	20.6	21.0	22.6
	21.4	21.4	23.0
	22.2	21.8	23.4
	23.0	22.2	23.8
Candelabra- base	15.9	16.7	18.3
	16.7	17.1	18.7
	17.5	17.5	19.1
	18.3	17.9	19.4
	19.1	18.3	19.8

NOTE — If the mouth of the lampholder is flared, the depth of the lampholder is to be disregarded at any point at which the diameter is greater than the indicated maximum. The specified depth is to exist at any one set of corresponding points within the indicated range of mouth diameters.

### 3.3.3 Wiring

**3.3.3.1** Flexible cords and wires used in the assembly of multiple-connected outfits shall be recognized as suitable for this use and shall comply with the requirements of IS:434 (Part I)-1964\* or IS:694 (Part I)-1964†.

**3.3.3.2** Braids of flexible cords and wires shall be prevented from unravelling at lampholders, attachment-plugs and other fittings.

**3.3.3.3** Except for candelabra-base lampholders intended for indoor use and for lampholders having pin-type terminals, connections between lampholder terminals and leads which are not sealed in place, shall be soldered.

**3.3.4 Strain Relief** — Adequate strain relief shall be provided for all wiring joints and wiring connections in accordance with 3.1.5.

### 3.4 Units

**3.4.1** Series-connected lampholders of units (wreath, star, cross, candle set, etc) shall comply with 3.1 and 3.2. Multiple-connected lampholders of units shall comply with the requirements of 3.1 and 3.3, except that removable pin-type lampholders are not acceptable.

\*Specification for rubber-insulated cables : Part I With copper conductors (revised).

†Specification for PVC insulated cables (for voltages up to 1 100 V): Part I With copper conductors (revised).

**3.4.2** Lampholders shall be reliably mounted on metal or other incombustible materials to prevent turning which would affect adversely any attached wires or flexible cords.

**3.4.3** The supply cord shall consist of adequate length of a type of flexible cord suitable for the particular use.

## 4. MARKING

**4.1** The decorative lighting outfits shall be marked with the following information:

- a) Name and/or trade-mark of the manufacturer or supplier,
- b) Type or serial number,
- c) Rated voltage and maximum load involved, and
- d) The words 'suitable for indoor use'.

**4.2** The decorative lighting outfits may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 5. TESTS

### 5.1 Classification of Tests

**5.1.1 Type Tests** — The following shall constitute type tests:

- a) Insulation resistance ( dry ) test ( *see* **11.2** of IS : 1913-1969\* ),
- b) High voltage test ( *see* **11.3** of IS : 1913-1969\* ),
- c) Insulation resistance ( humid ) test ( *see* **11.4** of IS : 1913-1969\* ),
- d) Cord anchorage test ( *see* **11.6** of IS : 1913-1969\* ),
- e) Heating test ( *see* **11.7** of IS : 1913-1969\* ),
- f) Test for mechanical strength ( *see* **11.8** of IS : 1913-1969\* ), and
- g) Accelerated ageing test ( *see* **5.2** ).

**5.1.2 Acceptance Tests** — The following shall be carried out as acceptance tests:

- a) Insulation resistance ( dry ) test ( *see* **11.2** of IS : 1913-1969\* ), and
- b) High voltage test ( *see* **11.3** of IS : 1913-1969\* ).

\*General and safety requirements for electric lighting fittings ( *first revision* ).

**5.1.2.1** The number of samples for acceptance tests shall be as agreed upon between the purchaser and the manufacturer. However, a recommended plan of sampling is given in Appendix B of IS : 1913-1969\*.

**5.1.3 Routine Tests** — The insulation resistance (dry) test and high voltage test shall be carried out as routine tests.

## **5.2 Test for Accelerated Ageing**

**5.2.1** A component part of an outfit made of moulded rubber or polyvinyl chloride, shall show no visible evidence of deterioration when subjected to the test given in **5.2.2** and **5.2.3**.

**5.2.2** A component part made of rubber shall be placed in an air-oven and maintained at a temperature of  $70^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for a period of 96 hours, or the sample may be placed in an oxygen bomb having a gas pressure of 21 kg/cm<sup>2</sup> and maintained at a temperature of  $70^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for a period of 96 hours.

**5.2.3** A component part made of polyvinyl chloride shall be placed in an air-oven and maintained at a temperature of  $100^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for a period of 96 hours.

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\*General and safety requirements for electric light fittings (*first revision*).

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